

Application of the Estuary Valley-Fill Facies Model – Stratigraphic Implications and Constraints

Gerry E. Reinson*
Reinson Consultants Ltd.
1100, 603 – 7th Avenue S.W., Calgary, AB, T2P 2T5
greinson@canadiandiscovery.com

and

J. Dennis Meloche
Devon Canada Corporation
1600, 324 – 8th Avenue S.W., Calgary, AB., T2P 2Z5

With respect to facies analysis, the past 15 years could be considered as the “Age of Incised Valley Fill (IVF)”. Further, estuary deposits have become synonymous with IVF. Published papers identifying ancient estuary sequences and incised valleys, based on a rigidly applied tripartite model, are commonplace and often misleading.

The problem arises from the assumption that the tripartite model is definitive for all ancient estuary successions. The recognition of estuary deposits does not depend on whether an incised valley or bayhead delta is evident, or even whether a significant bounding surface is recognized. Adherence to the tripartite model involves the need to identify estuarine point-bar deposits with attendant IHS beds, when in fact such deposits constitute a very small proportion of many estuary fills. Laterally extensive muddy bay-fill facies, accumulated during coastal inundation, are often overlooked because of the constraints imposed by the rigid application of the model.

It is important to recognize that there are several types of estuary systems, and the principal factors effecting system types are tidal range, rate of sediment supply and rate of change of accommodation. In the Alberta Foreland Basin, several types of estuary deposits are present. These deposits are examples from estuary systems formed under low sediment supply and slow rate of change of accommodation, high sediment supply and slow rate of accommodation change, and high sediment supply and high rate of accommodation change. In the latter case, whether the depositional processes are allogenic or autogenic is equivocal, since such a system approaches a classical “transgressive” delta setting.